CROSS REFERENCE TO RELATED APPLICATIONS

This application claims the benefit of U.S. Provisional Application No. 60/549,184, filed March 2, 2004, whose entire contents are hereby incorporated by reference.

BACKGROUND OF THE INVENTION

It is known to provide molded plastic taps for use with containers, in particular disposable containers of the type popular for supplying liquid such as water, wine or milk. One well known type of tap for this purpose is a so-called push button tap having a resilient plastic diaphragm which, when pressed, opens the valve to allow liquid to flow from the container. The resilient plastic diaphragm, commonly referred to as a "push button," can be arranged so that it positively urges the valve into a sealing position when manual pressure is removed therefrom. The tap is therefore self-closing.

An alternative to push button taps are the so-called "rotary" taps. In these, a cap is rotated to in turn rotate a stem within the tap body. Rotation of the stem causes it to uncover an aperture provided in the tap body through which or from which liquid is dispensed.

Irrespective of the type of tap used with a container, it has been found that smooth liquid flow with a stabilized flow profile can only be achieved if either the container is flexible, collapsing as liquid is dispensed, or the container is vented. The reason for this is that otherwise air must flow into the container to fill the space from which liquid has been vacated and equalize the pressure within the container. The inflow of air disrupts the outflow of liquid causing it to be uneven and reducing the flow rate.

SUMMARY OF THE INVENTION

Disclosed herein are air-vented closures for a fluid container, each closure having a dedicated liquid conduit and a dedicated air conduit. This allows air to flow into the container without encountering static or flowing liquid in the air conduit.

In an embodiment, an air-vented closure has a body having a docking member for connecting the closure to a container. The body has a first conduit and a second conduit, the first conduit being adapted for conveying liquid and having a liquid outlet, the second conduit being adapted for conveying air and having an air inlet. The closure also has a member having opposed first and second ends with a liquid outlet at the first end and an air inlet at the second end. The member is positionable with respect to the body from a closed position where no liquid flows through the first conduit to an open position where liquid can flow through the first conduit.

In another embodiment, the closure assembly has a valve body and a valve element. The valve body has a first fluid conduit and a second fluid conduit spaced from the first conduit. The valve body has a mounting sleeve in fluid communication with the first fluid conduit and the second fluid conduit, the mounting sleeve has an axis therethrough. The valve member may be positioned in the mounting sleeve for reciprocating movement therein from a closed position to an open position in response to rotation of the valve member about the axis. The valve member has a wall having a first end and an opposed second end, the valve member having a third fluid conduit therethrough. A first portion of the wall of the valve member may be removed to define an air inlet into the third fluid conduit and a second portion may be removed to define an air outlet from the third conduit. When the valve member is in the closed position a

portion of the valve member blocks fluid flow through the first conduit and a portion of the mounting sleeve blocks air flow from the air outlet. When the valve member is in the open position, fluid can flow through the first conduit and air can flow through the air outlet.

Also disclosed herein is a fluid container having an air vented closure attached thereto.

BRIEF DESCRIPTION OF THE FIGURES

FIG. 1 is an isometric view of a closure assembly of the present invention;

FIG. 2 is an end view of the closure of FIG. 1;

FIG. 3 is a side view in partial cross-section of the closure of **FIG. 1**;

FIG. 4 is a plan view in cross-section of the closure assembly taken along line X-X of FIG. 3;

FIG. 5 is a fluid container with the closure assembly of FIG. 1;

FIG. 6 is a side view in partial cross-section of the closure assembly in a closed position;

FIG. 7 is a side view in partial cross-section of the closure assembly in an open position;

FIG. 8 is a schematic view of an embodiment of an air vent of a valve element in an open position;

FIG. 9 is a schematic view of an embodiment of an air vent of a valve element in an open position;

FIG. 10 is a schematic view of an embodiment of an air vent of a valve element in an open position;